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PALEONTOLOGY.—*Setigerites* *nom. nov. a subgenus of Productus*.¹
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By a regrettable oversight, the writer, in the October number of this Journal, published the name *Setigerella* as a subgenus of *Productus*, overlooking the fact, which has been recently called to his attention, that *Setigerella* had been used by Ehrenberg as long ago as 1872. *Setigerella* Girty is herewith replaced by *Setigerites* Girty, with the same connotation.

BOTANY.—*A New palm from Costa Rica, Astrocaryum alatum*.²
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Florida. (Communicated by S. F. BLAKE.)

Botanists or others interested in the individual elements of the tropical forests through which passes the railroad leading from Puerto Limon to San Jose, Costa Rica, must have observed at frequent intervals in traversing the lowlands of the Province of Limon, a rather large palm with many graceful pinnate leaves, dark green above but pearl grayish-green on the underside. The trunk itself of the palm may be hidden completely by a varied growth of vines, aroids, ferns, and other small plants which find foothold in the accumulations of humus in the axils of the spiny leaf-bases which remain attached to the trunk long after the leaves have fallen. From the crown of leaves several densely packed clusters of large, spiny fruits droop on viciously spiny stems. Closer inspection reveals other details which show that the palm belongs to the genus *Astrocaryum*, represented in South America by many species but with only two species thus far recognized in Central America, *A. standleyanum* Bailey in Panama and *A. confertum* Wendl. in Costa Rica. Another species, found in Honduras, British Honduras, Guatemala and southern Mexico and long known as *A. mexicanum* Liebm., recently has been removed from *Astrocaryum* and made the type of the genus *Hexopetion*, and may be excluded from consideration here.

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² Received January 6, 1939.

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Attempts to identify the Limon Province palm with any of the recognized species of *Astrocaryum* have failed, and the conclusion is forced that, in spite of its abundance and long accessibility to collectors, it has remained undescribed. Hence, a technical account of the characters is presented and the specific name *alatum* is proposed in reference to the peculiar winged spines on the under side of the rachis of the leaves. *A. alatum* differs further from both *A. standleyanum* and *confertum* in having female flowers and fruits borne directly on the central spadix instead of on its lateral branches, these having the male flowers continuous from the base to or almost to the apex. The large, spiny, laterally compressed fruits also are distinctive.

In the neighborhood of Cairo, a few miles west of Siquirres, this palm is known only by the Spanish name "Coquito," this name being credited in Dahlgren's *Index of American Palms*, Field Mus. Nat. Hist., Bot. ser., 14, 1936, to the American oil palm, *Corozo oleifera*, in Costa Rica. The names "Zurubre," "Coyolillo," and "Coyolito," listed in the *Index* as applied to *Astrocaryum confertum*, were not recognized by the natives at Cairo as connected with any palm, hence it may be inferred that the range of *confertum* does not approach very close to Cairo.

Astrocaryum alatum Loomis, sp. nov.

Caudex solitarius 3-6 m altus 12-15 cm crassus non spinosus, basibus foliorum spinosis persistentibus; folia usque ad 6 dm longa, segmentis irregulariter contiguis, petiolo subtus spinoso spinis baseos applanatis usque ad 16 cm longis, rachi subtus spinosa spinis brevioribus lateraliter alatis; rami spadiceis plusquam 40 omnino staminei; flores femineae in rachi spadiceis inter ramos; fructus magnus spinosus apice subrostratus et inermis, in racemo compresso; semen obovatum apice rotundatum basi acutum extus fibrosum fibris complanatis ad foramina vergentibus.

Trunk solitary, 12 to 18 feet high and 5 to 6 inches in diameter, lacking spines but with spiny leaf-bases of the old leaves persistent to the ground; leaves numerous, 30 or more on mature palms, moderately arching, 18 to 20 feet long, the petiole accounting for half to a third of this length; pinnae seldom solitary, commonly in clusters of 2 to 15 segments completely joined, infrequently separated for a short distance above the base, the clusters of pinnae closely placed on the rachis, usually not over 2 inches apart; terminal 6 to 15 pinnae joined into a quadrangular group: one leaf-blade 11.5 feet long has 96 pinnae on the right side grouped in clusters as follows beginning at the base: 6-5-5-7-2-2-6-2-10-7-1-4-4-5-6-2-6-3-13; the 92 pinnae on the left side: 9-10-3-3-4-2-4-4-4-1-7-6-5-4-2-10-1-13; on this leaf the left basal pinna is 30 inches long, a pinna at middle of blade is 37.7 inches long, and the left terminal pinna is 8.2 inches long; individual pinnae, whether solitary or joined in groups, not over 1.2 inches wide; tips of pinnae obliquely erose-truncate; free lateral margins of pinnae with a few tiny brown terete spines; dorsal surface of pinnae dark green, glabrous,

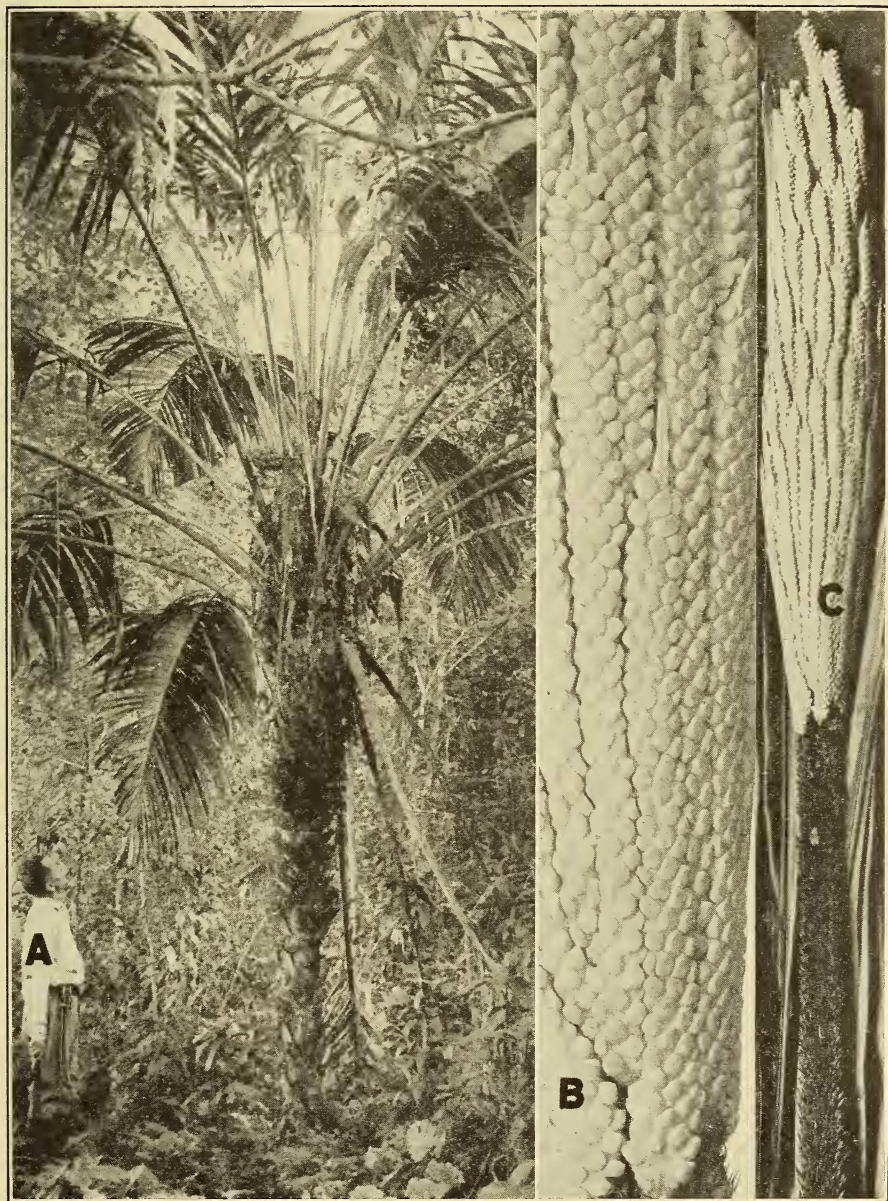


Fig. 1.—*Astrocaryum alatum*, n. sp. A, forest palm in fruit, the leaf-bases persistent to the ground. B, section of inflorescence of type specimen, natural size. C, type inflorescence, less than a third natural size. (A by H. F. Loomis, B and C by O. F. Cook & C. B. Doyle.)

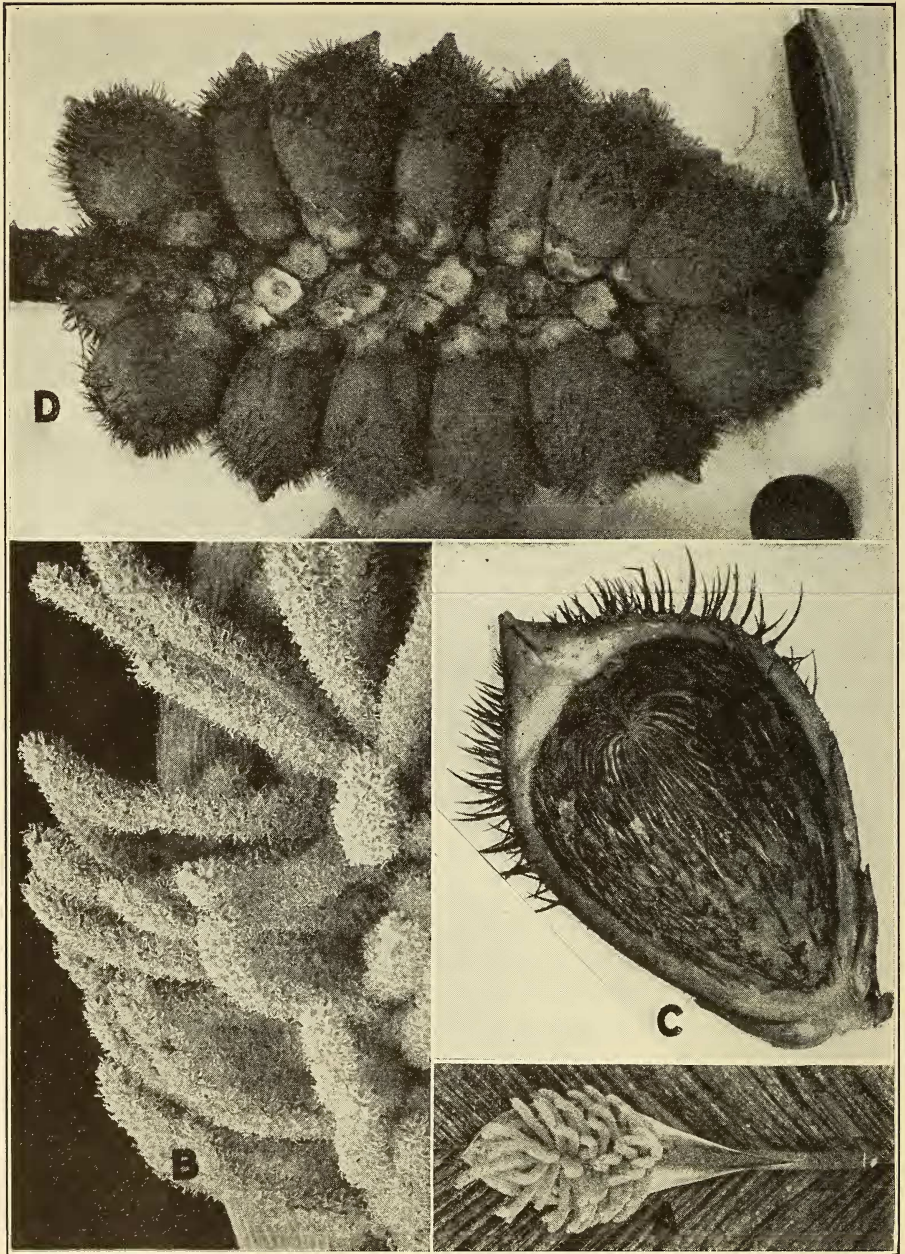


Fig. 2.—*Astrocaryum alatum*, n. sp. *A*, flowering inflorescence in spathe on a section of leaf, greatly reduced. *B*, close view of part of same inflorescence, less than half natural size. *C*, fruit cut to show seed, natural size. *D*, fruit cluster with some fruit removed to show arrangement and form of fruit, basal cups and spadix, less than half natural size. (*A* and *B* by H. Pittier, *C* by O. F. Cook & C. B. Doyle, *D* by H. F. Loomis.)

ventral surface silvery gray-green, densely scurfy and with minute erect spinules or glandular hairs scarcely visible without magnification but apparent to the touch; on young unexpanded leaves the tips of the pinnae on each side of the blade are joined or protected by a continuous strap-like element which separates from the tips when the leaf unfolds and hangs from the apex of the basal pinna, one such unbroken appendage which was collected is 8 feet 5 inches long and about a quarter of an inch wide, the outer end suddenly somewhat thickened and ending in a sheath-like hook with the surface and the outer margin of the strap below it beset with short, brown, ciliaceous spinules; leaf petioles from 6 to 10 feet long, smooth above and concave nearly to the blade, moderately spiny below at base which remains attached to the trunk long after the remainder of the leaf falls, the spines decreasing in number and size above, the basal ones black, simple, attaining 6.5 inches in length and a quarter of an inch across, in cross section lenticular, semi-circular or triangular; further out on the petiole, and especially on the rachis, the spines are flatter and develop a thin supplementary wing-like expansion on the basal half each side, its apical portion often acute and free from the spine, the outer margin sometimes slightly lacinate; spines deep brown, the lateral wings lighter, most spines somewhat reflexed, rising from the proximal side of a pulvinate swelling; rachis with a strong median rib above, ventral basal spines 1 to 1.5 inches long, outwardly decreasing in size and number and not present on the last foot or two of the rachis; spathe densely beset with suberect spines up to an inch long, the spathe splitting along the outer or lower side at flowering and afterward persisting and usually partly covering the fruit cluster; peduncle of inflorescence oval in cross section, less than 2 feet long and up to an inch broad, more densely spiny than any other part of the palm, the spines directed toward the inflorescence, less than half an inch long, flattened, the apical half often bent or even slightly undulate, the basal half densely woolly with lateral margins occasionally moderately winged, surface of peduncle between the spines also densely woolly; inflorescence short and thick, with over 40 simple branches attaining 7 inches in length and borne on a spadix 8 inches or more long; spadix and branches densely woolly between the flowers; branches completely occupied, except occasionally for a half inch at apex, by the male flowers which are closely crowded and in no consistent arrangement, basal or outer envelope of flowers small, chartaceous, with broadly triangular lobes reaching less than half way to the apex of the bud, open flowers not seen but in a detailed photograph taken many years ago the lobes of the inner envelope are not curved outward in the slightest, the elongate anthers borne on filaments twice as long; female flowers sessile, borne directly on the spadix among the simple branches but appearing to have no fixed relation to them, calyx and corolla distally provided with closely applied, ascending spinules, those on the calyx usually more strongly developed; on mature fruits the two basal envelopes are irregular produced at apex but are smaller and lacking the distinctly angular lobes of *A. standelyanum*; fruit clusters several to 8 or 9, infrequently suberect but usually drooping, composed of 25 to 50 large fruits attaining 3 inches in length and so tightly packed that their shape, and that of the enclosed seeds, is affected by mutual compression during growth and several flattened faces are produced on the basal portion of each fruit, distally the fruits are rounded, the surface rusty brownish-green with many erect, curved or straight spines not extending onto the produced, broadly conic tip; flesh of fruit white, firm, an eighth of an inch thick; seeds sometimes exceeding 2

inches in length, strongly oboval, sharply pointed at base, covered with coarse, very closely applied, irregularly ascending, branching fibers converging radially at the three pores; shell an eighth to a quarter of an inch thick, very hard; albumen white, hollow at center.

The foregoing description is based on material gathered in the forest and on palms examined there. In clearings where this palm has been allowed to remain, its aspect is quite different from that of the shade form, as it appears much more compact because the petioles and blades of the leaves are shorter, the latter with the groups of pinnae more closely placed on the rachis. Young palms of this species show a characteristic development of the leaves in that the pinnae almost never are separated; leaf-blades as much as four or five feet long remaining entire or at most with but one or two divisions on each side.

The type specimens deposited in the U. S. National Herbarium under numbers 474451-474457, were collected in the forest at Rio Hondo, Plains of Santa Clara, Costa Rica, altitude 100 meters, May 7, 1903, by O. F. Cook and C. B. Doyle under their number 584. Specimen 474452 is an inflorescence with flowers not quite old enough to open, the other specimens apparently are portions of a single leaf. Photographs of this species, made by O. F. Cook and C. B. Doyle in 1903 and H. Pittier in 1906, have been studied, parts of several of these being herein reproduced, and in addition the writer collected fruiting and leaf material at Cairo, Costa Rica, in 1937 and 1938 and sent it and seed to the Division of Plant Exploration and Introduction, Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C. Plants from these seeds were distributed to plant experimenters in Florida in 1938 under P. I. number 123380 with the tentative name *Astrocaryum polystachyum*, a name which appeared in the *Biologia Centrali-Americana* in 1885 without description and which has not yet been thus supported.

Although it is too soon to be certain that this handsome tropical woodland palm will survive and become a part of Florida's subtropical horticulture the growth of these seedlings has been more rapid than with other species of the genus tested at the U. S. Plant Introduction Garden, near Miami, and promises well for the future.

PLANT PHYSIOLOGY.—*Hydrocyanic acid content of sorghum varieties*.¹ JAMES F. COUCH, REINHOLD R. BRIESE, and J. H. MARTIN, Bureaus of Animal and Plant Industry, Washington, D. C.

Sorghum² has long been known to be poisonous to animals under certain conditions. The quantity of cyanogenetic glucoside in this plant is one of the factors that determine its toxicity. A large number of sorghum varieties are grown in the United States for feeding to livestock, any one of which may be eaten by animals while in a con-

¹ Cooperative investigation between the Pathological Division, Bureau of Animal Industry, and the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture. Received November 18, 1938.

² (*Sorghum vulgare*, Pers.)